



2019-2020

# Academic Supply and Occupational Demand Report



## Tennessee Higher Education Commission

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# Executive Summary

- Overall degree production is projected to continue increasing in the coming years.
  - Degree production at the certificate and associates level is projected to increase
  - Bachelor's degree production is projected to decrease slightly
- There is high demand for individuals trained in a variety of occupations across the state.
  - The occupations with the greatest number of projected annual openings include:
    - Heavy and Tractor-Trailer Truck Drivers
    - General and Operations Managers
    - Registered Nurses
    - First-Line Supervisors of Office and Administrative Support Workers
    - Elementary School Teachers, Except Special Education
  - Occupations with the greatest number of projected annual openings require all levels of education and training, from a high school diploma (or equivalent) through a graduate degree.
- Many higher education institutions in Tennessee offer academic programs that can meet the workforce needs of high-demand occupations.
  - Public, private, and proprietary institutions offer programs of all levels in majors related to these high-demand occupations.
  - Opportunities for postsecondary training in these occupations are available across the state and are not limited to specific geographic areas.
- Occupational demand varies slightly by region but is largely aligned with statewide workforce needs.
  - Variation at the regional level is often a matter of order. For example, while nearly every region has a demand for nurses, the level and significance of this need changes.
- Tennessee has a number of diploma, certificate, and associate's programs that provide pathways to high wages including:
  - Electrical, Electronic and Communications Engineering Technology
  - Diagnostic Medical Sonography/Sonographer and Ultrasound Tech
  - Truck and Bus Driver/Commercial Vehicle Operation
  - Computer and Information Systems Security
  - Engineering Technology, General

# Introduction

This report is prepared pursuant to Tennessee Code Annotated § 49-7-112(b), which directs the Tennessee Higher Education Commission (THEC) to “produce an annual report regarding state workforce need projections and credential production.”

This report is the result of a collaboration between THEC and the Tennessee Department of Labor and Workforce Development (TDLWD). Using data from academic years 2006 through 2016, THEC projected degree production for public, private, and proprietary<sup>1</sup> institutions in Tennessee through 2021 (i.e., academic supply). Separately, TDLWD projected the needs of Tennessee’s workforce (i.e., occupational demand) for 2016 through 2026 to determine which occupations will have the greatest number of annual openings. TDLWD then analyzed the credentials produced by Tennessee’s postsecondary institutions in the programs of study aligned with high-demand occupations to determine whether higher education is meeting the needs of employers.

## This report is divided into four sections:

- **Expected Degrees** presents projections of postsecondary credentials to be awarded by public, private, and proprietary institutions in Tennessee through 2021.
- **State Workforce Needs** identifies the top 25 high-demand occupations with the highest number of annual openings in Tennessee through 2026. This section also lists the most oversupplied programs of study in Tennessee, for which there are substantially more postsecondary graduates than job opportunities.
- **Institutions Offering Programs in High-Demand Occupations** lists the public, private, and proprietary institutions across Tennessee that offer programs in the 25 highest-demand occupations.
- **Limitations and Conclusions** describes the caveats in these analyses and summarizes the key takeaways of the report.

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<sup>1</sup> Proprietary institutions are also known as “for-profit” institutions.

# Data and Methods

Projections of degree production and workforce demand were developed independently by THEC and TDLWD, respectively. The sections below explain the methodology used to develop these projections and address important caveats for using these estimates.

## *Academic Supply Projections*

Postsecondary credentials are projected through academic year 2021, based on historical data for 2006 through 2016-17. The institutions included in these projections are public, private, and proprietary institutions in Tennessee that award postsecondary certificates, associate degrees, or bachelor's.<sup>2</sup> For public and proprietary institutions, THEC used historical data from its student information system, its Division of Postsecondary State Authorization, and the Integrated Postsecondary Education Data System (IPEDS).<sup>3</sup> For private institutions, THEC used historical data from the Tennessee Independent Colleges and Universities Association (TICUA) and IPEDS. Due to a lag in data publishing for IPEDS institutions, the full dataset of degree production in Tennessee is only available through 2016-17. The projections include certificates of less than two years in length, associate degrees, and bachelor's. THEC's projections are aggregated at the degree level; degree production is not disaggregated by major or concentration.

## *Occupational Demand Projections*

TDLWD projected occupational demand by Standard Occupation Classification (SOC) code. The Bureau of Labor Statistics provides information about the education and training required for specific occupations across the state. These education and training requirements reflect what is typically observed for an employee in a given occupation, though exceptions exist. Except where otherwise noted, any mention of "high-demand occupations" in this report refers to the 25 highest demand occupations with the greatest number of annual openings listed in **Table 1**.

One of the primary data sets used to identify workforce demand is Tennessee's long-term occupational projections (from 2016 to 2026), including expected annual total openings. The openings consist of those created by growth and by occupational separations. Additional criteria including real-time labor market information from Tennessee's jobs database were used to present a more comprehensive picture of occupations in demand and their characteristics.

The average annual occupational projections are then compared to the number of people being trained in Tennessee in related programs of study to see if shortages of workers in certain occupations are expected (**Table 2**). The relationship between education requirements and occupation is most direct for highly specialized fields, such as those requiring a specific certificate or an advanced degree. Conversely,

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<sup>2</sup> Only certificates, associate degrees, and bachelor's degrees are included in the analysis to better align this report with Tennessee's Drive to 55 initiative, which set the goal of increasing Tennessee's educational attainment to 55% by 2025.

<sup>3</sup> IPEDS is a federal dataset containing information about higher education institutions, including student demographics, program offerings, and completion data. Data are available at <https://nces.ed.gov/ipeds/>



many fields requiring a bachelor's are less clearly defined, as those who hold a bachelor's often have diverse employment opportunities in a variety of fields.

### *Wage Data by Classification of Instructional Programs (CIP) Code*

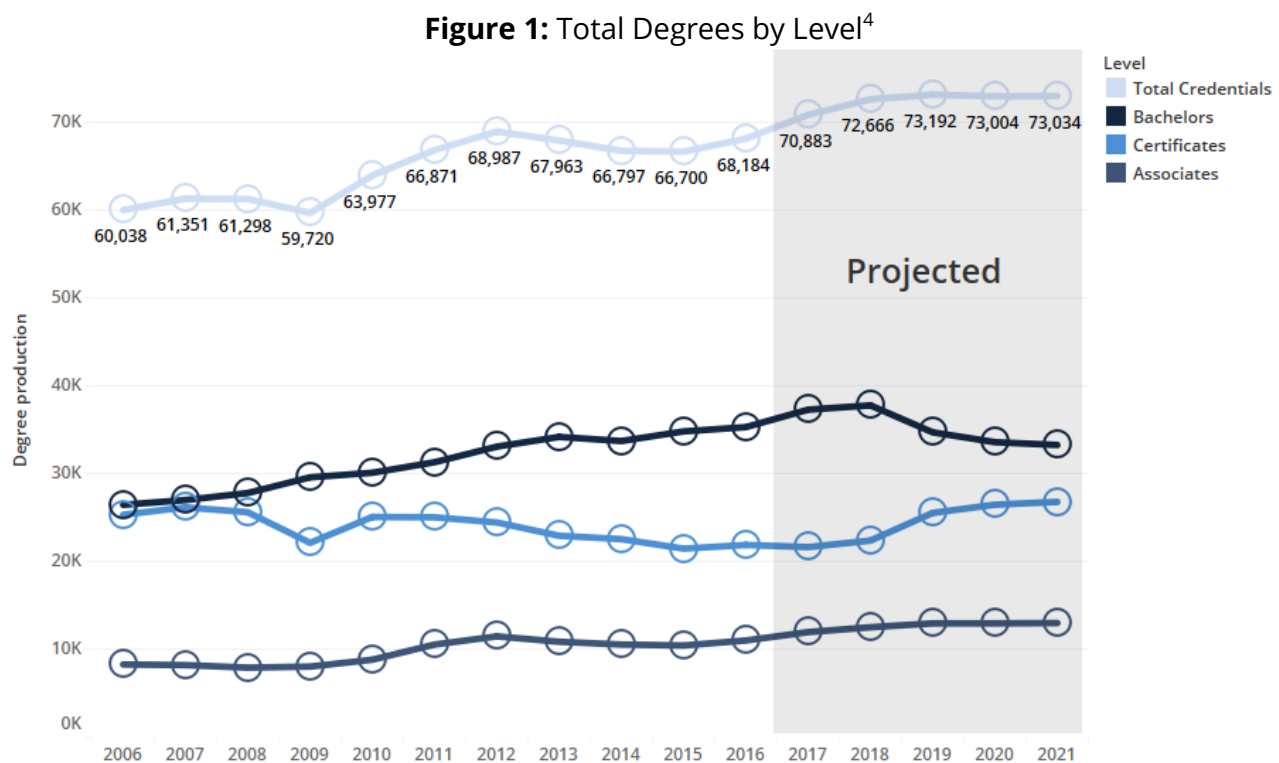
Wage data by Classification of Instructional Program (CIP) code tables are created using Tennessee's State Longitudinal Data System (SLDS), also known as P20 Connect. Detailed educational program outcome information within programs of study can be found in the appendix. With increasing concern about degree value, the appendix lists CIP level wage data for graduates of 100 public, private, and proprietary schools across Tennessee during 2017-2018 including the name of each program, its CIP code, and the average wage by program for those earning wages in Tennessee and not enrolled in school. Programs differ widely in the average wages of graduates as they enter the workforce.

# SECTION I.

# Expected Degrees

This section projects the supply of postsecondary credentials to be awarded by public, private, and proprietary institutions in Tennessee. These projections forecast various degree levels by institutional sector through academic year 2021. **Figures 1** through **4** below show historical degree production on the left and projected degree production in the shaded area to the right.

**Figure 1** displays the total degrees produced and projected at institutions of higher education in Tennessee. Degree production is expected to continue increasing in Tennessee, although this year's projections suggest more moderate growth than previous projections in this report. This is largely due to an update in the model suggesting lower overall numbers of high school graduates in the coming years. The growth in degree production is expected to occur at the certificate and associates levels.

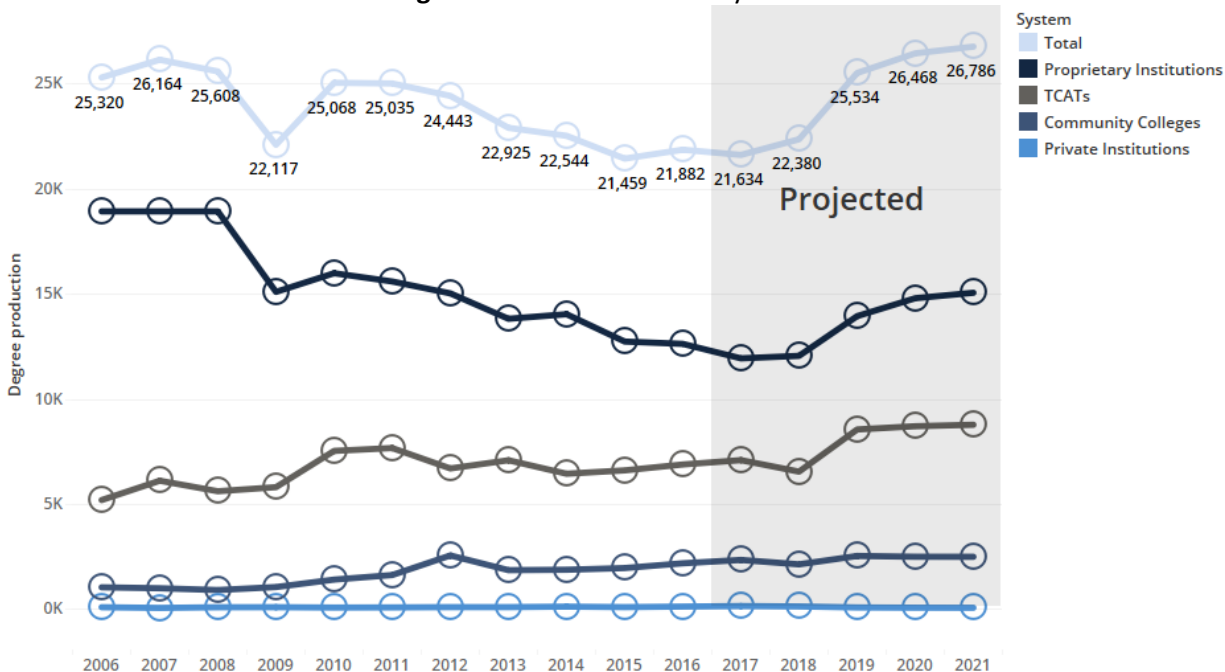


**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

**Figure 2** displays the certificates produced and projected, by sector. Overall certificate production is projected to increase in the coming years. This projected increase is most salient at the Tennessee Colleges of Applied Technology (TCATs) and proprietary institutions.

<sup>4</sup> Given that the model is built on historical data, it will take some time for the projections to account for potential declines in production due to school closures at proprietary institutions in Tennessee.

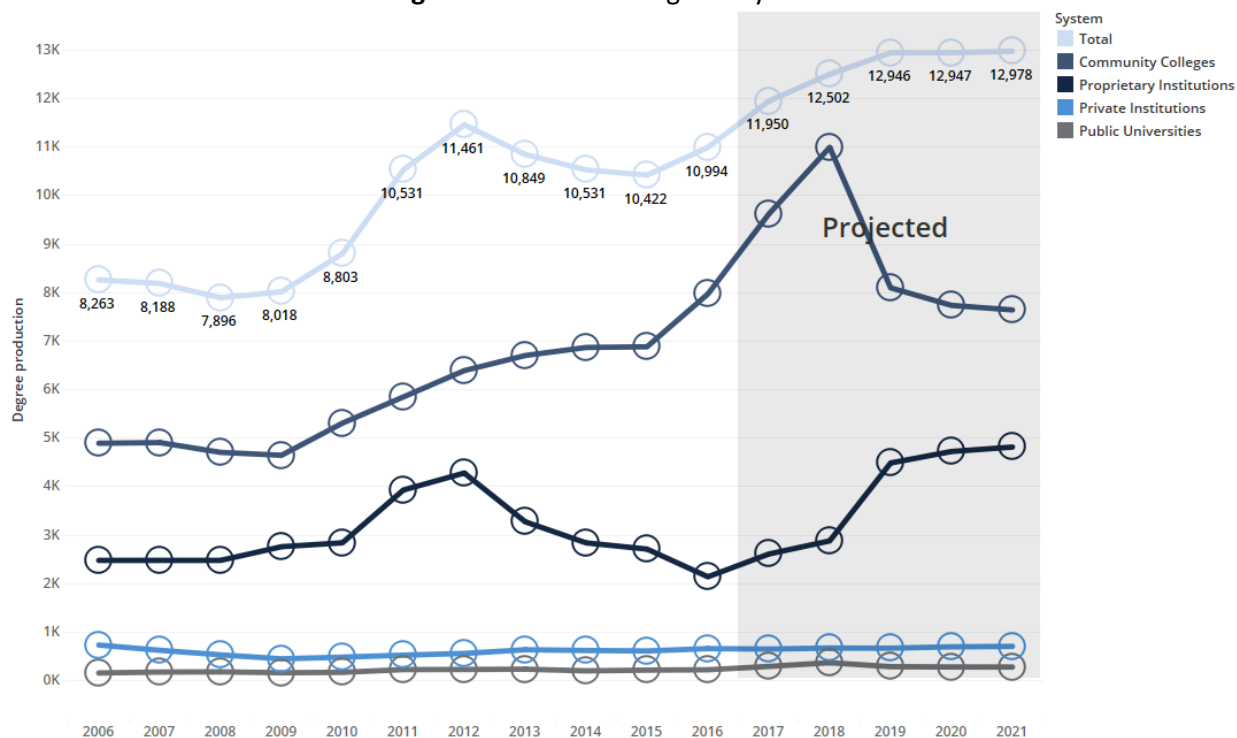
**Figure 2: Total Certificates by Sector**



**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

**Figure 3** depicts the associates degrees produced and projected, by sector. Associate degree production is expected to maintain its trajectory of growth from the past decade. Community college data in this figure are up to date through 2018. The model suggests a calming of the rapid growth in associate degree production experienced at community colleges in the past four years.

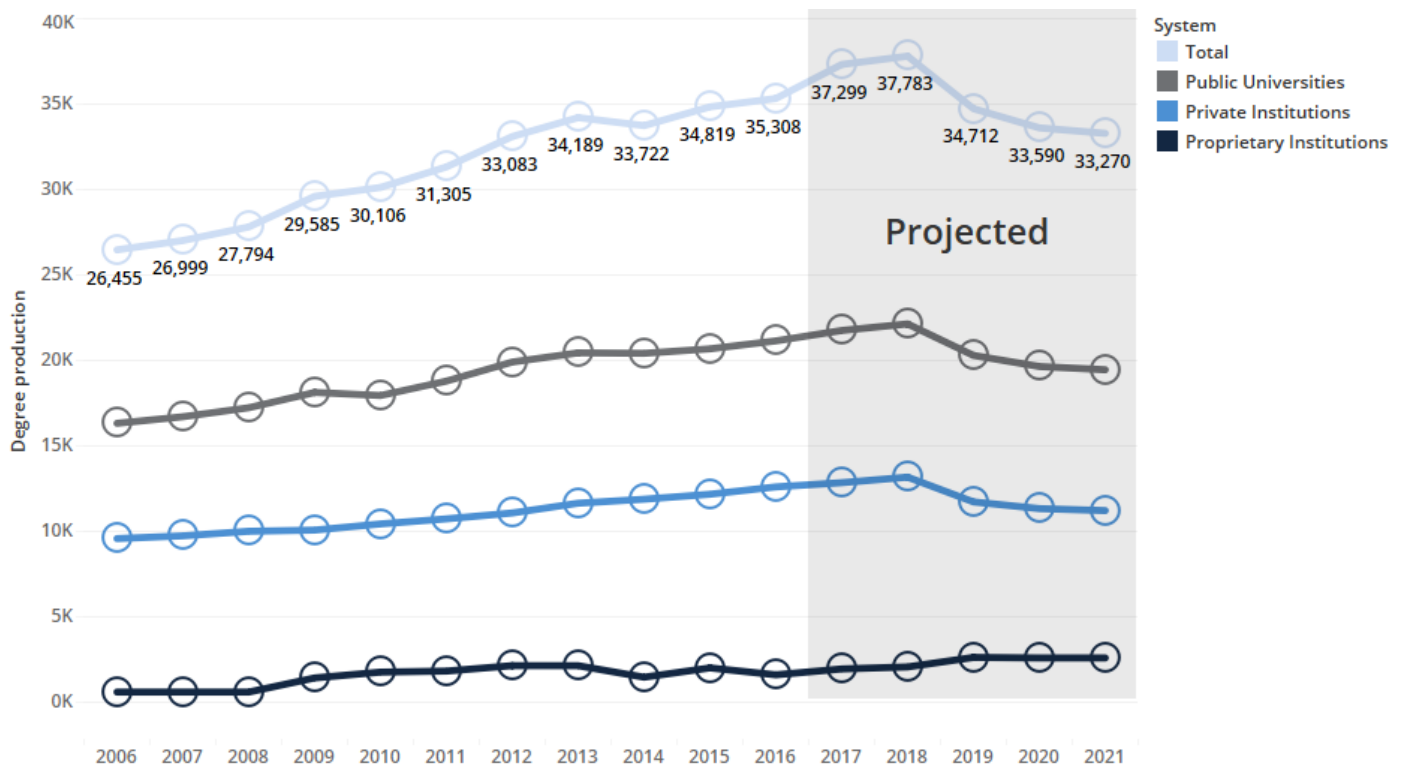
**Figure 3: Associates Degrees by Sector**



**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

**Figure 4** shows the bachelor's degrees produced and projected, by sector. Bachelor's degree production is projected to decline slightly in coming years.

**Figure 4: Bachelor's by Sector**



**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

# SECTION II.

## State Workforce Needs

The Tennessee Department of Labor and Workforce Development's Workforce Insights, Research and Reporting Engine Division (WIR<sup>2</sup>ED) prepares information annually on top occupations and programs of study with expected workforce demand. Several indicators have been used to identify the top occupations and programs.

- The occupation is within a program of study with an expected positive growth rate from 2016 to 2026, and in which the number of awards is no more than 1.5 times the number of total annual openings.<sup>5</sup>
- For January to March 31, 2019, for the occupation, the number of job candidates with active resumes on jobs4tn.gov was less than or equal to the number of job openings (the ratio of job candidates to job postings was 1.0 or less), indicating a shortage of applicants;
- Occupations with high or medium level employment compared to state total employment;
- Occupations with an entry-level annual wage of more than \$28,000;
- Occupations requiring at least a high school diploma or the equivalent.

### Clusters with the Greatest Number of Expected Annual Openings

*Business Management* 14,470

*Health Science* 11,555

*Education and Training* 6,035

Occupations with \$70,000 or more in entry-level wages include, among others, natural sciences managers, architecture and engineering managers, nurse anesthetists, nurse practitioners, physicians, pharmacists, and nuclear and materials engineers. Computer network architects earned nearly \$67,000 in entry-level salaries. Some of the occupations with significant shortages of trained workers include management and operations research analysts, personal financial advisors, nurse anesthetists and RNs, MRI technicians, healthcare social workers, machinery maintenance workers, police officers, software developers (applications and systems), and civil and safety engineers.

**Table 1** lists the highest demand occupations in Tennessee within 15 major clusters or areas of academic concentration. The areas of concentration range from architecture and construction to business, education, human services, information technology, manufacturing and science, technology, engineering, and mathematics (STEM), among others. The criteria used to select these occupations have been broadened to include real time data on job seekers and jobs posted from TDLWD's extensive online database in jobs4tn.gov.

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<sup>5</sup> A program of study (POS) is a group of educational programs and related occupations for which they may train.

**Table 1: Top 25 High-Demand Occupations with the Greatest Number of Annual Openings**

| <b>SOC Code</b> | <b>Occupational Title</b>   | <b>Annual Openings</b> | <b>Education Level</b>   | <b>Candidates Per Job Opening</b> | <b>2018 Annual Wage</b> |
|-----------------|---|------------------------|--------------------------|-----------------------------------|-------------------------|
| 53-3032         | Heavy and Tractor-Trailer Truck Drivers   | 7,615                  | Postsecondary Award      | 0.41                              | \$28,681                |
| 11-1021         | General and Operations Managers   | 4,685                  | Bachelor's               | 0.71                              | \$45,088                |
| 29-1141         | Registered Nurses   | 4,310                  | Bachelor's               | 0.08                              | \$46,748                |
| 43-1011         | First-Line Supervisors of Office and Administrative Support Workers                   | 3,975                  | High school diploma      | 0.56                              | \$34,266                |
| 25-2021         | Elementary School Teachers, Except Special Education                                  | 2,420                  | Bachelor's               | 0.75                              | \$40,928                |
| 29-2061         | Licensed Practical and Licensed Vocational Nurses                                     | 2,245                  | Postsecondary Award      | 0.27                              | \$33,004                |
| 13-2011         | Accountants and Auditors  | 2,185                  | Bachelor's               | 0.70                              | \$43,133                |
| 51-1011         | First-Line Supervisors of Production and Operating Workers                            | 1,775                  | High school diploma      | 0.70                              | \$36,889                |
| 11-3031         | Financial Managers  | 1,590                  | Bachelor's               | 0.73                              | \$57,363                |
| 25-2031         | Secondary School Teachers, Except Special and Career/Technical Education              | 1,495                  | Bachelor's               | 0.55                              | \$41,196                |
| 21-2011         | Clergy  | 1,465                  | Bachelor's               | 0.80                              | \$30,508                |
| 15-1151         | Computer User Support Specialists   | 1,135                  | Postsecondary Award      | 0.45                              | \$31,765                |
| 49-1011         | First-Line Supervisors of Mechanics, Installers, and Repairers                        | 1,105                  | High school diploma      | 0.71                              | \$40,928                |
| 49-9021         | Heating, Air Conditioning, and Refrigeration Mechanics and Installers                 | 1,080                  | Postsecondary Award      | 0.57                              | \$29,969                |
| 11-9111         | Medical and Health Services Managers  | 1,060                  | Bachelor's               | 0.74                              | \$58,233                |
| 13-1161         | Market Research Analysts and Marketing Specialists                                    | 1,055                  | Bachelor's               | 0.61                              | \$34,594                |
| 11-2022         | Sales Managers  | 995                    | Bachelor's               | 0.76                              | \$58,387                |
| 43-5061         | Production, Planning, and Expediting Clerks   | 970                    | High school diploma      | 0.80                              | \$30,504                |
| 41-4011         | Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products | 965                    | Bachelor's               | 0.90                              | \$36,970                |
| 33-3051         | Police and Sheriff's Patrol Officers  | 960                    | High school diploma      | 0.66                              | \$31,360                |
| 13-1111         | Management Analysts   | 925                    | Bachelor's               | 0.20                              | \$50,770                |
| 25-1071         | Health Specialties Teachers, Postsecondary  | 845                    | Doctoral or professional | 0.67                              | \$35,106                |
| 11-9141         | Property, Real Estate, and Community Association Managers                             | 825                    | High school diploma      | 1.00                              | \$31,324                |
| 49-3031         | Bus and Truck Mechanics and Diesel Engine Specialists                                 | 825                    | High school diploma      | 0.40                              | \$32,024                |
| 25-2022         | Middle School Teachers, Except Special and Career/Technical Education                 | 820                    | Bachelor's               | .51                               | \$41,487                |



# SECTION III.

**Table 2** provides employment rates and earned wages for graduates in programs of study corresponding to the occupations in demand in Table 1. For example, accountants and auditors has been identified as a demand occupation in table 1, in program of study 04.2110000; in table 2, in program of study 04.2110000, Accounting, outcomes for graduates of accounting programs at the corresponding educational level are presented.

This table includes the number of graduates or concentrators in each program of study by level of education. Included are the number of graduates who work for employers reporting wages in Tennessee, the percent employed and their median wage six months after graduation. An estimate of their annual wage appears in the final column. These results exclude individuals who were enrolled at another educational institution in Tennessee within two quarters of graduation. For outcomes by specific educational programs within the programs of study, see the related table in the appendix. Programs of study reporting graduate placements of 80 percent or more include:

- **Certificate level-** ultrasonic technician
- **Associate degree level-** medical technicians including cardiovascular and medical records, respiratory therapy, physical therapy assistant, production maintenance and operations, and engineering technology
- **Post baccalaureate-** registered nursing, library science, and web/multimedia management, programming
- **Master's degree-** educational administration and financial planning
- **Doctorate-** occupational therapy

Clusters with the largest number of degree level completers with estimated annual median salaries greater than \$50,000 include health science, STEM , and business management. All clusters except architecture and construction, arts and communication, and human services had at least one degree-level completer with estimated median salary at this level.

**Table 2:** Employment Rates for the Programs of Study and Award Levels for the Top 25 Occupations

| <b>SOC Code</b> | <b>Program of Study Code</b> | <b>Program of Study Title</b>                                       | <b>Number of Awards</b> | <b>Number Employed</b> | <b>Percent Employed</b> |
|-----------------|------------------------------|---|-------------------------|------------------------|-------------------------|
| 53-3032         | 16.1300000                   | Truck, Bus, Rail, Water Transportation, and Heavy Equipment         | 495                     | 107                    | 21.61%                  |
| 11-1021         | 04.1000000                   | Business Management   | 2669                    | 1647                   | 61.71%                  |
| 29-1141         | 08.1110000                   | Nursing (RN)  | 2042                    | 1476                   | 72.21%                  |
| 43-1011         | 04.6000000                   | Administrative and Information Support                              | 285                     | 166                    | 58.25%                  |
| 25-2021         | 05.1170000                   | Elementary Teachers, Except Special Education                       | 126                     | 77                     | 61.11%                  |
| 29-2061         | 08.1140000                   | Practical Nurse (LPN)   | 1222                    | 616                    | 50.4%                   |
| 13-2011         | 04.2110000                   | Accounting  | 592                     | 411                    | 69.43%                  |
| 51-1011         | 13.1000000                   | Precision Production Pathway  | 107                     | 74                     | 69.16%                  |
| 11-3031         | 06.3110000                   | Banking and Finance   | 230                     | 120                    | 52.17%                  |
| 25-2031         | 05.1180000                   | Middle, Secondary and Vocational Education Teachers                 | 1068                    | 770                    | 72.10%                  |
| 21-2011         | 10.3120000                   | Religion  | 29                      | 13                     | 44.83%                  |
| 15-1151         | 11.3400000                   | Web/Multimedia Management, Programming                              | 275                     | 190                    | 69.09%                  |
| 49-1011         | 13.2200000                   | Prod. Design, Ops, and Maintenance Path -- Operations & Maintenance | 39                      | 28                     | 71.79%                  |
| 49-9021         | 02.2400000                   | Construction Pathway - Construction HVAC/R                          | 322                     | 136                    | 42.23%                  |
| 11-9111         | 04.1000000                   | Business Management   | 2669                    | 1647                   | 61.71%                  |
| 13-1161         | 14.1000000                   | Marketing Management and Research                                   | 586                     | 370                    | 63.14%                  |
| 11-2022         | 14.2000000                   | Selling and Sales Management  | 8                       | 5                      | 62.50%                  |
| 43-5061         | 14.6000000                   | Channel Management  | ---                     | ---                    | ---                     |
| 41-4011         | 14.2000000                   | Selling and Sales Management  | 8                       | 5                      | 62.50%                  |
| 33-3051         | 12.4130000                   | Law Enforcement   | 489                     | 257                    | 52.56%                  |
| 13-1111         | 04.4000000                   | Business Analysis   | 104                     | 52                     | 50.00%                  |
| 25-1071         | 08.1390000                   | Health Specialties Teachers, Postsecondary                          | ---                     | ---                    | ---                     |
| 11-9141         | 04.1000000                   | Business Management   | 74                      | 41                     | 55.4%                   |
| 49-3031         | 16.4300000                   | Diesel Technology   | 106                     | 66                     | 66.2%                   |
| 25-2022         | 05.1180000                   | Middle, Secondary and Vocational Education Teachers                 | 1068                    | 770                    | 72.10%                  |

**Note:** Not all programs of study had completion data in Tennessee's longitudinal data system. Those with missing data have been left blank.

There are also a number of programs that are oversupplied in the workforce. **Table 3** presents the programs that graduate a significantly larger number of students than jobs expected to be available, leading to very strong competition for individuals trained in the occupations. Additional information on industry and occupational trends can be found in *Tennessee's Economy 2018*<sup>6</sup> and *The Demand for STEM Occupations in Tennessee*<sup>7</sup>.

**Table 3: Oversupplied Programs**

| <b>Program of Study Code</b> | <b>Program of Study Title</b>              |
|------------------------------|--|
| 05.1130000                   | Support Services- Interpreters/Translators |
| 05.1230000                   | Postsecondary Teachers- Teacher Education  |
| 08.1280000                   | Optometry                                  |
| 08.1360000                   | Radiation Therapy                          |
| 08.1410000                   | Exercise Physiology                        |
| 08.4140000                   | Dietitian Assistance                       |
| 11.3100000                   | Interactive Media                          |
| 15.1120000                   | Chemical Engineering                       |
| 15.1220000                   | Biomedical Engineering                     |

<sup>6</sup> <https://www.tn.gov/workforce/general-resources/major-publications0/major-publications-redirect/public-reports-redirect/tennessees-economy.html>

<sup>7</sup> <https://www.jobs4tn.gov/admin/gsipub/htmlarea/uploads/LMI/Publications/STEMReport2019Updated.pdf>

# Institutions Offering Programs in High-Demand Occupations

The following section presents the academic programs available at public, private, and proprietary postsecondary institutions in Tennessee that produce graduates who are employable in each high-demand program of study<sup>8</sup> (corresponding to the program of study codes in **Table 2**).<sup>9</sup> Each table includes the institution name, the system to which the institution belongs,<sup>10</sup> the grand division in which the institution is located, and the degree level offered by the institution (certificate, associate degree, bachelor's, graduate certificate, or graduate degree).

## *Truck, Bus, Rail, Water Transportation, and Heavy Equipment*

Careers in this program of study include heavy and tractor trailer truck drivers and bus drivers. The typical education requirement is a postsecondary award. Postsecondary certificates in this program of study are available at the following institutions:

| Institution Name                                 | System      | Grand Division |
|--|-------------|----------------|
| TCAT Memphis                                     | TBR         | East           |
| TCAT Newbern                                     | TBR         | East           |
| TCAT Shelbyville                                 | TBR         | Middle         |
| TCAT Crossville                                  | TBR         | West           |
| TCAT Jackson                                     | TBR         | East           |
| TCAT Knoxville                                   | TBR         | West           |
| TCAT Nashville                                   | TBR         | Middle         |
| Fortis Institute-Cookeville                      | Proprietary | Middle         |
| Platt College-Miller-Motte Technical-Chattanooga | Proprietary | East           |
| Vatterott College-Applying Farms                 | Proprietary | East           |

## *Business Management*

Careers in this program of study include general managers, medical managers, real estate managers, and administrative services managers. The typical education requirement is a bachelor's degree. Bachelor's degrees in this program of study are available at the following institutions:

| Institution Name                            | System | Grand Division |
|---|--------|----------------|
| Austin Peay State University                | LGI    | Middle         |
| Baptist Memorial College of Health Sciences | TICUA  | West           |
| Belmont University                          | TICUA  | Middle         |
| Bethel University                           | TICUA  | West           |
| Bryan College-Dayton                        | TICUA  | East           |
| Carson-Newman University                    | TICUA  | East           |

<sup>8</sup> These programs were identified by TDLWD as providing the necessary award to enter a respective field. Additional institutions and programs may exist that prepare students to enter a respective field of work.

<sup>9</sup> Some of the closely-related occupations share the same program of study code, so there are only 19 programs of study detailed in this section. These 19 programs of study encompass all 25 high-demand occupations.

<sup>10</sup> Institutions are identified as part of the Tennessee Board of Regents (TBR), University of Tennessee (UT), or TICUA or are listed as Private, non-profit or Proprietary (for-profit). Public four-year institutions that were formerly governed by TBR are now identified as locally governed institutions (LGIs).

| <b>Institution Name</b>                 | <b>System</b>       | <b>Grand Division</b> |
|---|---------------------|-----------------------|
| Christian Brothers University           | TICUA               | West                  |
| Cumberland University                   | TICUA               | Middle                |
| Daymar College-Clarksville              | Proprietary         | Middle                |
| Daymar College-Nashville                | Proprietary         | Middle                |
| DeVry University-Tennessee              | Proprietary         | Middle                |
| East Tennessee State University         | LGI                 | East                  |
| Fisk University                         | TICUA               | Middle                |
| Freed-Hardeman University               | TICUA               | West                  |
| Johnson University                      | TICUA               | East                  |
| King University                         | TICUA               | East                  |
| Lane College                            | TICUA               | West                  |
| Le Moyne-Owen College                   | TICUA               | West                  |
| Lee University                          | TICUA               | East                  |
| Lincoln Memorial University             | TICUA               | East                  |
| Lipscomb University                     | TICUA               | Middle                |
| Martin Methodist College                | TICUA               | Middle                |
| Maryville College                       | TICUA               | East                  |
| Middle Tennessee State University       | LGI                 | Middle                |
| Milligan College                        | TICUA               | East                  |
| Rhodes College                          | TICUA               | West                  |
| South College                           | Proprietary         | East                  |
| Southern Adventist University           | TICUA               | East                  |
| Strayer University-Tennessee            | Proprietary         | West                  |
| Tennessee State University              | LGI                 | Middle                |
| Tennessee Technological University      | LGI                 | Middle                |
| Tennessee Wesleyan University           | TICUA               | East                  |
| The University of Tennessee-Chattanooga | UT                  | East                  |
| The University of Tennessee-Knoxville   | UT                  | East                  |
| The University of Tennessee-Martin      | UT                  | West                  |
| Trevecca Nazarene University            | TICUA               | Middle                |
| Tusculum College                        | TICUA               | East                  |
| Union University                        | TICUA               | West                  |
| University of Memphis                   | LGI                 | West                  |
| University of Phoenix-Tennessee         | Proprietary         | Middle                |
| Visible Music College                   | Private, non-profit | West                  |
| Welch College                           | TICUA               | Middle                |

## *Nursing (RN)*

Careers in this program of study include registered nurses, nurse midwives, and nursing instructors. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| Institution Name                                  | System      | Grand Division |
|---|-------------|----------------|
| Austin Peay State University                      | LGI         | Middle         |
| Baptist Memorial College of Health Sciences       | TICUA       | West           |
| Belmont University                                | TICUA       | Middle         |
| Bethel University                                 | TICUA       | West           |
| Carson-Newman University                          | TICUA       | East           |
| Cumberland University                             | TICUA       | Middle         |
| East Tennessee State University                   | LGI         | East           |
| Freed-Hardeman University                         | TICUA       | West           |
| King University                                   | TICUA       | East           |
| Lee University                                    | TICUA       | East           |
| Lincoln Memorial University                       | TICUA       | East           |
| Lipscomb University                               | TICUA       | Middle         |
| Martin Methodist College                          | TICUA       | Middle         |
| Middle Tennessee State University                 | LGI         | Middle         |
| Milligan College                                  | TICUA       | East           |
| South College                                     | Proprietary | East           |
| Southern Adventist University                     | TICUA       | East           |
| Tennessee State University                        | LGI         | Middle         |
| Tennessee Technological University                | LGI         | Middle         |
| Tennessee Wesleyan University                     | TICUA       | East           |
| The University of Tennessee-Chattanooga           | UT          | East           |
| The University of Tennessee-Health Science Center | UT          | West           |
| The University of Tennessee-Knoxville             | UT          | East           |
| The University of Tennessee-Martin                | UT          | West           |
| Trevecca Nazarene University                      | TICUA       | Middle         |
| Tusculum College                                  | TICUA       | East           |
| Union University                                  | TICUA       | West           |
| University of Memphis                             | LGI         | West           |

## *Administrative and Information Support*

Careers in this program of study include customer service representatives, secretaries and administrative assistants, first-line supervisors of office and administrative staff. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

| <b>Institution Name</b>                                  | <b>System</b>       | <b>Grand Division</b> |
|--|---------------------|-----------------------|
| Allied Health Careers Institute                          | Proprietary         | Middle                |
| Bethel University  | TICUA               | West                  |
| Brightwood College-Nashville                             | Proprietary         | Middle                |
| Chattanooga College Medical Dental and Technical Careers | Proprietary         | East                  |
| Chattanooga State Community College                      | TBR                 | East                  |
| Cleveland State Community College                        | TBR                 | East                  |
| Concorde Career College-Memphis                          | Proprietary         | West                  |
| Daymar College Clarksville                               | Proprietary         | Middle                |
| Daymar College Murfreesboro                              | Proprietary         | Middle                |
| Daymar College Nashville                                 | Proprietary         | Middle                |
| Motlow State Community College                           | TBR                 | Middle                |
| Nashville College of Medical Careers                     | Proprietary         | Middle                |
| Nashville State Community College                        | TBR                 | Middle                |
| National College-Nashville                               | Proprietary         | Middle                |
| Northeast State Community College                        | TBR                 | East                  |
| Pellissippi State Community College                      | TBR                 | East                  |
| Platt College-Miller-Motte Technical-Chattanooga         | Proprietary         | East                  |
| Remington College-Memphis Campus                         | Private, non-profit | West                  |
| Roane State Community College                            | TBR                 | East                  |
| Southwest Tennessee Community College                    | TBR                 | West                  |
| TCAT Nashville   | TBR                 | Middle                |
| TCAT Athens  | TBR                 | East                  |
| TCAT Covington   | TBR                 | West                  |
| TCAT Crossville  | TBR                 | East                  |
| TCAT Crump   | TBR                 | West                  |
| TCAT Dickson   | TBR                 | Middle                |
| TCAT Elizabethton  | TBR                 | East                  |
| TCAT Harriman  | TBR                 | East                  |
| TCAT Hartsville  | TBR                 | Middle                |
| TCAT Hohenwald   | TBR                 | Middle                |
| TCAT Jacksboro   | TBR                 | East                  |
| TCAT Jackson   | TBR                 | West                  |
| TCAT Knoxville   | TBR                 | East                  |
| TCAT Livingston  | TBR                 | Middle                |
| TCAT McKenzie  | TBR                 | West                  |



|   |             |        |
|---|-------------|--------|
| TCAT Memphis                                      | TBR         | West   |
| TCAT Morristown                                   | TBR         | East   |
| TCAT Murfreesboro                                 | TBR         | Middle |
| TCAT Oneida-Huntsville                            | TBR         | East   |
| TCAT Paris  | TBR         | West   |
| TCAT Pulaski                                      | TBR         | Middle |
| TCAT Ripley                                       | TBR         | West   |
| TCAT Shelbyville                                  | TBR         | Middle |
| TCAT Whiteville                                   | TBR         | West   |
| The University of Tennessee Health Science Center | TBR         | #N/A   |
| Vatterott College-Appling Farms                   | Proprietary | West   |
| Vatterott College-Dividend                        | Proprietary | West   |
| Virginia College-Chattanooga                      | Proprietary | East   |
| Virginia College-Knoxville                        | Proprietary | East   |
| Volunteer State Community College                 | TBR         | Middle |
| Walters State Community College                   | TBR         | East   |

### *Elementary Teachers, Except Special Education*

Careers in this program of study include elementary school teachers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| <b>Institution Name</b>                 | <b>System</b> | <b>Grand Division</b> |
|---|---------------|-----------------------|
| Belmont University                      | TICUA         | Middle                |
| Bethel University                       | TICUA         | West                  |
| Bryan College-Dayton                    | TICUA         | East                  |
| Carson-Newman University                | TICUA         | East                  |
| Christian Brothers University           | TICUA         | West                  |
| Cumberland University                   | TICUA         | Middle                |
| East Tennessee State University         | LGI           | East                  |
| Freed-Hardeman University               | TICUA         | West                  |
| Johnson University                      | TICUA         | East                  |
| Lee University                          | TICUA         | East                  |
| Lincoln Memorial University             | TICUA         | East                  |
| Lipscomb University                     | TICUA         | Middle                |
| Martin Methodist College                | TICUA         | Middle                |
| Northeast State Community College       | TBR           | East                  |
| South College                           | Proprietary   | East                  |
| Southern Adventist University           | TICUA         | East                  |
| Tennessee State University              | LGI           | Middle                |
| Tennessee Technological University      | LGI           | Middle                |
| Tennessee Wesleyan University           | TICUA         | East                  |
| The University of Tennessee-Chattanooga | UT            | East                  |

|                              |       |        |
|------------------------------|-------|--------|
| Trevecca Nazarene University | TICUA | Middle |
| Union University             | TICUA | West   |
| Vanderbilt University        | TICUA | Middle |
| Welch College                | TICUA | Middle |

### *Practical Nursing (LPN)*

Careers in this program of study include licensed practical and licensed vocational nurses. The typical education requirement is a postsecondary certificate. Postsecondary certificates in this program of study are available at the following institutions:

| <b>Institution Name</b>                                  | <b>System</b> | <b>Grand Division</b> |
|--|---------------|-----------------------|
| TCAT Athens  | TBR           | Middle                |
| TCAT Covington   | TBR           | East                  |
| TCAT Dickson   | TBR           | Middle                |
| Chattanooga College Medical Dental and Technical Careers | Proprietary   | Middle                |
| TCAT Elizabethton  | TBR           | West                  |
| TCAT Harriman  | TBR           | West                  |
| TCAT Hartsville  | TBR           | Middle                |
| TCAT Hohenwald   | TBR           | Middle                |
| TCAT Jacksboro   | TBR           | West                  |
| Lincoln Memorial University                              | TICUA         | West                  |
| TCAT Livingston  | TBR           | Middle                |
| TCAT Memphis   | TBR           | East                  |
| TCAT Morristown  | TBR           | West                  |
| TCAT Murfreesboro  | TBR           | Middle                |
| TCAT Newbern   | TBR           | East                  |
| TCAT Paris   | TBR           | East                  |
| TCAT Pulaski   | TBR           | Middle                |
| TCAT Ripley  | TBR           | East                  |
| TCAT Crump   | TBR           | East                  |

### *Accounting*

Careers in this program of study include customer accountants and auditors. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| <b>Institution Name</b>       | <b>System</b> | <b>Grand Division</b> |
|-------------------------------|---------------|-----------------------|
| Austin Peay State University  | LGI           | Middle                |
| Belmont University            | TICUA         | Middle                |
| Bethel University             | TICUA         | West                  |
| Carson-Newman University      | TICUA         | East                  |
| Christian Brothers University | TICUA         | West                  |
| Cumberland University         | TICUA         | Middle                |

|   |             |        |
|---|-------------|--------|
| DeVry University-Tennessee              | Proprietary | Middle |
| East Tennessee State University         | LGI         | East   |
| Freed-Hardeman University               | TICUA       | West   |
| Le Moyne-Owen College                   | TICUA       | West   |
| Lee University                          | TICUA       | East   |
| Lincoln Memorial University             | TICUA       | East   |
| Lipscomb University                     | TICUA       | Middle |
| Martin Methodist College                | TICUA       | Middle |
| Maryville College                       | TICUA       | East   |
| Middle Tennessee State University       | LGI         | Middle |
| Milligan College                        | TICUA       | East   |
| National College-Nashville              | Proprietary | Middle |
| Rhodes College                          | TICUA       | West   |
| South College                           | Proprietary | East   |
| Southern Adventist University           | TICUA       | East   |
| Strayer University-Tennessee            | Proprietary | West   |
| Tennessee State University              | LGI         | Middle |
| Tennessee Technological University      | LGI         | Middle |
| Tennessee Wesleyan University           | TBR         | East   |
| The University of Tennessee-Chattanooga | TBR         | East   |
| The University of Tennessee-Knoxville   | TBR         | East   |
| The University of Tennessee-Martin      | TBR         | West   |
| Trevecca Nazarene University            | TBR         | Middle |
| Union University                        | TBR         | West   |
| University of Memphis                   | TBR         | West   |
| University of Phoenix-Tennessee         | TBR         | Middle |
| Vanderbilt University                   | TBR         | Middle |

### *Precision Production Pathway*

Careers in this program of study include machinists, team assemblers, machine setters and operators, and tool and die makers. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

| <b>Institution Name</b>           | <b>System</b> | <b>Grand Division</b> |
|-----------------------------------|---------------|-----------------------|
| Northeast State Community College | TBR           | East                  |
| TCAT Athens                       | TBR           | East                  |
| TCAT Covington                    | TBR           | West                  |
| TCAT Crossville                   | TBR           | East                  |
| TCAT Crump                        | TBR           | West                  |
| TCAT Dickson                      | TBR           | Middle                |
| TCAT Harriman                     | TBR           | East                  |

| <b>Institution Name</b>             | <b>System</b>       | <b>Grand Division</b> |
|-------------------------------------|---------------------|-----------------------|
| TCAT Hartsville                     | TBR                 | Middle                |
| TCAT Hohenwald                      | TBR                 | Middle                |
| TCAT Jacksboro                      | TBR                 | East                  |
| TCAT Jackson                        | TBR                 | West                  |
| TCAT Knoxville                      | TBR                 | East                  |
| TCAT Livingston                     | TBR                 | Middle                |
| TCAT McKenzie                       | TBR                 | West                  |
| TCAT McMinnville                    | TBR                 | Middle                |
| TCAT Memphis                        | TBR                 | West                  |
| TCAT Morristown                     | TBR                 | East                  |
| TCAT Murfreesboro                   | TBR                 | Middle                |
| TCAT Nashville                      | TBR                 | Middle                |
| TCAT Newbern                        | TBR                 | West                  |
| TCAT Oneida-Huntsville              | TBR                 | East                  |
| TCAT Paris                          | TBR                 | West                  |
| TCAT Pulaski                        | TBR                 | Middle                |
| TCAT Shelbyville                    | TBR                 | Middle                |
| TCAT Whiteville                     | TBR                 | West                  |
| William Moore College of Technology | Private, non-profit | West                  |

### *Banking and Finance*

Careers in this program of study include insurance sales agents, financial managers, and loan officers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| <b>Institution Name</b>            | <b>System</b> | <b>Grand Division</b> |
|------------------------------------|---------------|-----------------------|
| Belmont University                 | TICUA         | Middle                |
| Carson-Newman University           | TICUA         | East                  |
| Christian Brothers University      | TICUA         | West                  |
| East Tennessee State University    | LGI           | East                  |
| Lipscomb University                | TICUA         | Middle                |
| Maryville College                  | TICUA         | East                  |
| Middle Tennessee State University  | LGI           | Middle                |
| Milligan College                   | TICUA         | East                  |
| Rhodes College                     | TICUA         | West                  |
| Roane State Community College      | TBR           | East                  |
| Southern Adventist University      | TICUA         | East                  |
| Strayer University-Tennessee       | Proprietary   | West                  |
| Tennessee State University         | LGI           | Middle                |
| Tennessee Technological University | LGI           | Middle                |

|   |       |        |
|---|-------|--------|
| The University of Tennessee-Chattanooga | UT    | East   |
| The University of Tennessee-Knoxville   | UT    | East   |
| The University of Tennessee-Martin      | UT    | West   |
| The University of the South             | TICUA | Middle |
| Union University                        | TICUA | West   |
| University of Memphis                   | LGI   | West   |
| Vanderbilt University                   | TICUA | Middle |

### *Middle, Secondary and Vocational Education Teachers*

Careers in this program of study include secondary school teachers, middle school teachers, and career and technical education teachers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| <b>Institution Name</b>                 | <b>System</b> | <b>Grand Division</b> |
|---|---------------|-----------------------|
| Austin Peay State University            | LGI           | Middle                |
| Belmont University                      | TICUA         | Middle                |
| Bethel University                       | TICUA         | West                  |
| Bryan College-Dayton                    | TICUA         | East                  |
| Carson-Newman University                | TICUA         | East                  |
| Cumberland University                   | TICUA         | Middle                |
| East Tennessee State University         | LGI           | East                  |
| Freed-Hardeman University               | TICUA         | West                  |
| Johnson University                      | TICUA         | East                  |
| King University                         | TICUA         | East                  |
| Lane College                            | TICUA         | West                  |
| Lee University                          | TICUA         | East                  |
| Lipscomb University                     | TICUA         | Middle                |
| Martin Methodist College                | TICUA         | Middle                |
| Maryville College                       | TICUA         | East                  |
| Middle Tennessee State University       | LGI           | Middle                |
| Southern Adventist University           | TICUA         | East                  |
| Tennessee State University              | LGI           | Middle                |
| Tennessee Technological University      | LGI           | Middle                |
| Tennessee Wesleyan University           | TICUA         | East                  |
| The University of Tennessee-Chattanooga | UT            | East                  |
| The University of Tennessee-Knoxville   | UT            | East                  |
| The University of Tennessee-Martin      | UT            | West                  |
| Trevecca Nazarene University            | TICUA         | Middle                |
| Tusculum College                        | TICUA         | East                  |
| Union University                        | TICUA         | West                  |
| University of Memphis                   | LGI           | West                  |
| Vanderbilt University                   | TICUA         | Middle                |
| Welch College                           | TICUA         | Middle                |

## Religion

Careers in this program of study include clergy and postsecondary philosophy and religion teachers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| Institution Name                        | System              | Grand Division |
|---|---------------------|----------------|
| Austin Peay State University            | LGI                 | Middle         |
| Belmont University                      | TICUA               | Middle         |
| Bryan College-Dayton                    | TICUA               | East           |
| Carson-Newman University                | TICUA               | East           |
| Christian Brothers University           | TICUA               | West           |
| East Tennessee State University         | LGI                 | East           |
| Freed-Hardeman University               | TICUA               | West           |
| Johnson University                      | TICUA               | East           |
| King University                         | TICUA               | East           |
| Lane College                            | TICUA               | West           |
| Lee University                          | TICUA               | East           |
| Lincoln Memorial University             | TICUA               | East           |
| Lipscomb University                     | TICUA               | Middle         |
| Martin Methodist College                | TICUA               | Middle         |
| Maryville College                       | TICUA               | East           |
| Memphis Theological Seminary            | Private, non-profit | West           |
| Middle Tennessee State University       | LGI                 | Middle         |
| Mid-South Christian College             | Private, non-profit | West           |
| Milligan College                        | TICUA               | East           |
| Pentecostal Theological Seminary        | #N/A                | #N/A           |
| Rhodes College                          | TICUA               | West           |
| Southern Adventist University           | TICUA               | East           |
| The University of Tennessee-Chattanooga | UT                  | East           |
| The University of Tennessee-Knoxville   | UT                  | East           |
| The University of Tennessee-Martin      | TBR                 | West           |
| The University of the South             | TBR                 | #N/A           |
| Trevecca Nazarene University            | TBR                 | Middle         |
| Union University                        | TBR                 | West           |
| University of Memphis                   | TBR                 | West           |
| Vanderbilt University                   | TBR                 | Middle         |
| Welch College                           | TBR                 | Middle         |

## *Web/Multimedia Management, Programming*

Careers in this program of study include computer support specialists, computer systems analysts, software developers, and computer and information systems managers. The typical education requirement is a postsecondary award or a bachelor's. Associate degrees and/or bachelor's in this program of study are available at the following institutions:

| <b>Institution Name</b>                 | <b>System</b> | <b>Grand Division</b> |
|---|---------------|-----------------------|
| Austin Peay State University            | LGI           | Middle                |
| Belmont University                      | TICUA         | Middle                |
| Bethel University                       | TICUA         | West                  |
| Carson-Newman University                | TICUA         | East                  |
| Chattanooga State Community College     | TBR           | East                  |
| Christian Brothers University           | TICUA         | West                  |
| Cleveland State Community College       | TBR           | East                  |
| Columbia State Community College        | TBR           | Middle                |
| Daymar College-Clarksville              | Proprietary   | Middle                |
| DeVry University-Tennessee              | Proprietary   | Middle                |
| Dyersburg State Community College       | TBR           | West                  |
| East Tennessee State University         | LGI           | East                  |
| Fisk University                         | TICUA         | Middle                |
| Freed-Hardeman University               | TICUA         | West                  |
| Jackson State Community College         | TBR           | West                  |
| King University                         | TICUA         | East                  |
| Lane College                            | TICUA         | West                  |
| Le Moyne-Owen College                   | TICUA         | West                  |
| Lee University                          | TICUA         | East                  |
| Lipscomb University                     | TICUA         | Middle                |
| Martin Methodist College                | TICUA         | Middle                |
| Maryville College                       | TICUA         | East                  |
| Middle Tennessee State University       | LGI           | Middle                |
| Milligan College                        | TICUA         | East                  |
| Nashville State Community College       | TBR           | Middle                |
| National College-Nashville              | Proprietary   | Middle                |
| Northeast State Community College       | TBR           | East                  |
| Pellissippi State Community College     | TBR           | East                  |
| Rhodes College                          | TICUA         | West                  |
| Roane State Community College           | TBR           | East                  |
| Sewanee-The University of the South     | TICUA         | Middle                |
| Southern Adventist University           | TICUA         | East                  |
| Southwest Tennessee Community College   | TBR           | West                  |
| Strayer University-Tennessee            | Proprietary   | West                  |
| Tennessee State University              | LGI           | Middle                |
| Tennessee Technological University      | LGI           | Middle                |
| The University of Tennessee-Chattanooga | UT            | East                  |

| <b>Institution Name</b>               | <b>System</b> | <b>Grand Division</b> |
|---------------------------------------|---------------|-----------------------|
| The University of Tennessee-Knoxville | UT            | East                  |
| The University of Tennessee-Martin    | UT            | West                  |
| Trevecca Nazarene University          | TICUA         | Middle                |
| Union University                      | TICUA         | West                  |
| University of Memphis                 | LGI           | West                  |
| University of Phoenix-Tennessee       | Proprietary   | Middle                |
| Vanderbilt University                 | TICUA         | Middle                |
| Volunteer State Community College     | TBR           | Middle                |
| Walters State Community College       | TBR           | East                  |

### *Production, Design, Operations, and Maintenance Path – Operations & Maintenance*

Careers in this program of study include maintenance and repair workers, inspectors, mechanics, and purchasing agents. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

| <b>Institution Name</b>               | <b>System</b> | <b>Grand Division</b> |
|---------------------------------------|---------------|-----------------------|
| Chattanooga State Community College   | TBR           | East                  |
| Cleveland State Community College     | TBR           | East                  |
| Columbia State Community College      | TBR           | Middle                |
| Dyersburg State Community College     | TBR           | West                  |
| Motlow State Community College        | TBR           | Middle                |
| Nashville State Community College     | TBR           | Middle                |
| Pellissippi State Community College   | TBR           | East                  |
| Roane State Community College         | TBR           | East                  |
| Southwest Tennessee Community College | TBR           | West                  |
| TCAT Athens                           | TBR           | East                  |
| TCAT Covington                        | TBR           | West                  |
| TCAT Crossville                       | TBR           | East                  |
| TCAT Crump                            | TBR           | West                  |
| TCAT Dickson                          | TBR           | Middle                |
| TCAT Elizabethton                     | TBR           | East                  |
| TCAT Harriman                         | TBR           | East                  |
| TCAT Hartsville                       | TBR           | Middle                |
| TCAT Hohenwald                        | TBR           | Middle                |
| TCAT Jackson                          | TBR           | West                  |
| TCAT Knoxville                        | TBR           | East                  |
| TCAT Livingston                       | TBR           | Middle                |
| TCAT McKenzie                         | TBR           | West                  |
| TCAT McMinnville                      | TBR           | Middle                |
| TCAT Memphis                          | TBR           | West                  |
| TCAT Morristown                       | TBR           | East                  |
| TCAT Murfreesboro                     | TBR           | Middle                |



| Institution Name | System | Grand Division |
|------------------|--------|----------------|
| TCAT Newbern     | TBR    | West           |
| TCAT Paris       | TBR    | West           |
| TCAT Pulaski     | TBR    | Middle         |
| TCAT Ripley      | TBR    | West           |
| TCAT Shelbyville | TBR    | Middle         |
| TCAT Whiteville  | TBR    | West           |

### *Construction Pathway - Construction HVAC/R*

Careers in this program of study include Heating, Air Conditioning, and Refrigeration Mechanics. The typical education requirement is a postsecondary certificate. Postsecondary certificates are available at the following institutions:

| Institution Name                    | System              | Grand Division |
|-------------------------------------|---------------------|----------------|
| Northeast State Community College   | TBR                 | East           |
| TCAT Athens                         | TBR                 | East           |
| TCAT Covington                      | TBR                 | West           |
| TCAT Crossville                     | TBR                 | East           |
| TCAT Crump                          | TBR                 | West           |
| TCAT Dickson                        | TBR                 | Middle         |
| TCAT Harriman                       | TBR                 | East           |
| TCAT Hartsville                     | TBR                 | Middle         |
| TCAT Hohenwald                      | TBR                 | Middle         |
| TCAT Jacksboro                      | TBR                 | East           |
| TCAT Jackson                        | TBR                 | West           |
| TCAT Knoxville                      | TBR                 | East           |
| TCAT Livingston                     | TBR                 | Middle         |
| TCAT McKenzie                       | TBR                 | West           |
| TCAT McMinnville                    | TBR                 | Middle         |
| TCAT Memphis                        | TBR                 | West           |
| TCAT Morristown                     | TBR                 | East           |
| TCAT Murfreesboro                   | TBR                 | Middle         |
| TCAT Nashville                      | TBR                 | Middle         |
| TCAT Newbern                        | TBR                 | West           |
| TCAT Oneida-Huntsville              | TBR                 | East           |
| TCAT Paris                          | TBR                 | West           |
| TCAT Pulaski                        | TBR                 | Middle         |
| TCAT Shelbyville                    | TBR                 | Middle         |
| TCAT Whiteville                     | TBR                 | West           |
| William Moore College of Technology | Private, non-profit | West           |

## *Marketing Management and Research*

Careers in this program of study include market research analysts, marketing managers, and advertising and promotion managers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| <b>Institution Name</b>               | <b>System</b> | <b>Grand Division</b> |
|---------------------------------------|---------------|-----------------------|
| Austin Peay State University          | LGI           | Middle                |
| Belmont University                    | TICUA         | Middle                |
| Carson-Newman University              | TICUA         | East                  |
| Christian Brothers University         | TICUA         | West                  |
| Cumberland University                 | TICUA         | Middle                |
| East Tennessee State University       | LGI           | East                  |
| Freed-Hardeman University             | TICUA         | West                  |
| Lee University                        | TICUA         | East                  |
| Lincoln Memorial University           | TICUA         | East                  |
| Lipscomb University                   | TICUA         | Middle                |
| Maryville College                     | TICUA         | East                  |
| Middle Tennessee State University     | LGI           | Middle                |
| South College                         | Proprietary   | East                  |
| Southern Adventist University         | TICUA         | East                  |
| Tennessee Technological University    | LGI           | Middle                |
| Tennessee Wesleyan University         | TICUA         | East                  |
| The University of Tennessee-Knoxville | UT            | East                  |
| The University of Tennessee-Martin    | UT            | West                  |
| Trevecca Nazarene University          | TICUA         | Middle                |
| Union University                      | TICUA         | West                  |
| University of Memphis                 | LGI           | West                  |
| University of Phoenix-Tennessee       | Proprietary   | Middle                |

## *Selling and Sales Management*

Careers in this program of study include sales representatives, sales managers, real estate agents, and advertising agents. The typical education requirement is a bachelor's. Bachelor's and/or graduate degrees in this program of study are available at the following institutions:

| <b>Institution Name</b>         | <b>System</b> | <b>Grand Division</b> |
|---------------------------------|---------------|-----------------------|
| East Tennessee State University | LGI           | East                  |
| Southern Adventist University   | TICUA         | East                  |

## *Law Enforcement*

Careers in this program of study include police officers, emergency dispatchers, detectives, and criminal investigators. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

| <b>Institution Name</b>           | <b>System</b> | <b>Grand Division</b> |
|-----------------------------------|---------------|-----------------------|
| Cleveland State Community College | TBR           | East                  |

| <b>Institution Name</b>           | <b>System</b> | <b>Grand Division</b> |
|-----------------------------------|---------------|-----------------------|
| Daymar College-Clarksville        | Proprietary   | Middle                |
| Daymar College-Murfreesboro       | Proprietary   | Middle                |
| Dyersburg State Community College | TBR           | West                  |
| Nashville State Community College | TBR           | Middle                |
| Volunteer State Community College | TBR           | Middle                |
| Walters State Community College   | TBR           | East                  |

### *Business Analysis*

Careers in this program of study include business operations specialists, management analysts, and operations research analysts. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

| <b>Institution Name</b>               | <b>System</b> | <b>Grand Division</b> |
|---------------------------------------|---------------|-----------------------|
| Belmont University                    | TICUA         | Middle                |
| Bethel University                     | TICUA         | West                  |
| Carson-Newman University              | TICUA         | East                  |
| Christian Brothers University         | TICUA         | West                  |
| DeVry University-Tennessee            | Proprietary   | Middle                |
| Lee University                        | TICUA         | East                  |
| Lipscomb University                   | TICUA         | Middle                |
| Martin Methodist College              | TICUA         | Middle                |
| Maryville College                     | TICUA         | East                  |
| Middle Tennessee State University     | LGI           | Middle                |
| Southern Adventist University         | TICUA         | East                  |
| The University of Tennessee-Knoxville | UT            | East                  |
| The University of Tennessee-Martin    | UT            | West                  |
| University of Memphis                 | LGI           | West                  |
| Vanderbilt University                 | TICUA         | Middle                |

### *Diesel Technology*

Careers in this program of study include bus and truck mechanics and diesel engine specialists. The typical education requirement is a postsecondary credential. Postsecondary credentials in this program of study are available at the following institutions:

| <b>Institution Name</b>                 | <b>System</b> | <b>Grand Division</b> |
|---|---------------|-----------------------|
| TCAT Elizabethton                       | TBR           | West Region           |
| TCAT Harriman                           | TBR           | West Region           |
| TCAT Livingston                         | TBR           | Middle Region         |
| TCAT Memphis                            | TBR           | East Region           |
| Lincoln College of Technology-Nashville | Proprietary   | Middle Region         |
| TCAT Newbern                            | TBR           | East Region           |
| TCAT Knoxville                          | TBR           | West Region           |
| Vatterott College-Applying Farms        | Proprietary   | East Region           |

# SECTION IV.

## *Limitations*

Supply and demand analyses are useful for educators, employers, and policymakers, but there are two underlying limitations.

First, supply and demand analyses rely on historical data and assumptions about future economic conditions, as well as industry expansion or contraction. For this reason, projections are sometimes inaccurate for certain occupations, particularly emerging fields with limited historical data and those fields with high supply-to-demand ratios (oversupplied fields).

Second, the relationship between supply and demand is most direct at the sub-baccalaureate level and with specialized programs at the doctoral and professional level. For example, a person with a certificate in automotive repair or a medical specialization in cardiology is more likely to hold a job specific to their field of study than a person with a bachelor's degree in English. As such, it is more straightforward to link individuals with specialized degrees to specific occupations. This is not as true for those with versatile bachelor's and master's degrees, as graduates with these degrees are employable in many fields.

## *Conclusions*

Projections of postsecondary degree production indicate that certificates and associates degrees will continue to grow in annual production, while bachelor's degrees decrease slightly. These projections will continue to change as the data that inform them update. The degree production models listed in this report should serve as a guide for understanding future degree production trends.

Many of the in-demand occupations listed in this report have made this list for several years. Policymakers should strongly consider the ways in which they might help bolster the workforce talent pool for all in-demand occupations, but particularly those for which the state is consistently undersupplied. This includes programs of study like business management, nursing, and web/multimedia management programming.

Occupational demand varies by region, as this report has highlighted in its regional demand tables in Appendix B. While many of the occupational demands are the same across the state, the number and nature of the in demand occupations is region specific. These tables should serve as a guide to regional workforce planning for communities, policymakers, and institutions of higher education.

Finally, for the first time this report included wage data by CIP code. These data should help inform students as they mark out their career paths. These tables highlight the many academic programs that have provided good labor market outcomes for Tennesseans. In particular, this section highlights a number of certificates and degrees of no more than two years that have been associated with wages at or above \$28,000 after graduation. These types of programs could be tuition- and fee- free for many Tennesseans under Tennessee Promise or Reconnect, and could help improve labor market outcomes for students.

# APPENDIX

# Appendix A: Program of Study Clusters

Similar academic programs are grouped into 16 program of study clusters. **Table B-1** lists the two-digit cluster codes as well as the cluster titles, provided by TDLWD.

**Table A-1:** Program of Study Cluster Codes and Titles

| Two-Digit Program of Study Cluster Code | Program of Study Cluster Title                    |
|---|---|
| 01.0                                    | Agriculture, Food, and Natural Resources          |
| 02.0                                    | Architecture and Construction                     |
| 03.0                                    | Arts, A/V Technology, and Communications          |
| 04.0                                    | Business Management and Administration            |
| 05.0                                    | Education and Training                            |
| 06.0                                    | Finance   |
| 07.0                                    | Government and Public Administration              |
| 08.0                                    | Health Science                                    |
| 09.0                                    | Hospitality and Tourism                           |
| 10.0                                    | Human Service                                     |
| 11.0                                    | Information Technology                            |
| 12.0                                    | Public Safety, Corrections, and Security          |
| 13.0                                    | Manufacturing                                     |
| 14.0                                    | Sales   |
| 15.0                                    | Science, Technology, Engineering, and Mathematics |
| 16.0                                    | Transportation                                    |

Source: TDLWD

## Appendix B: Regional Workforce Demand

**Figure B-1:** Map of Tennessee Regions



Source: TNECD, LEAP Report Dashboard

**Table B-3:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

### East Region

| SOC Code | Occupational Title   | Annual Openings | Education Level     | Candidates per Job opening | 2018 Annual Wage |
|----------|--|-----------------|---------------------|----------------------------|------------------|
| 53-3032  | Heavy and Tractor-Trailer Truck Drivers                                  | 1235            | Postsecondary award | 0.67                       | \$29,172         |
| 11-1021  | General and Operations Managers  | 825             | Bachelor's          | 0.90                       | \$41,282         |
| 29-1141  | Registered Nurses  | 605             | Bachelor's          | 0.14                       | \$43,773         |
| 29-2061  | Licensed Practical and Licensed Vocational Nurses                        | 350             | Postsecondary award | 0.35                       | \$32,371         |
| 51-1011  | First-Line Supervisors of Production and Operating Workers               | 330             | High school diploma | 0.42                       | \$37,162         |
| 13-1199  | Business Operations Specialists, All Other                               | 265             | Bachelor's          | 0.87                       | \$32,347         |
| 11-3031  | Financial Managers   | 250             | Bachelor's          | 0.91                       | \$49,767         |
| 25-2031  | Secondary School Teachers, Except Special and Career/Technical Education | 240             | Bachelor's          | 0.23                       | \$40,912         |
| 49-9021  | Heating, Air Conditioning, and Refrigeration Mechanics and Installers    | 215             | Postsecondary award | 0.94                       | \$31,363         |
| 33-3051  | Police and Sheriff's Patrol Officers                                     | 180             | High school diploma | 0.85                       | \$30,578         |



**Table B-2:** Top 10 High-Demand Occupations with the Greatest Number of Annual Opening**Greater Memphis Region**

| <b>SOC Code</b> | <b>Occupational Title</b>  | <b>Annual Openings</b> | <b>Education Level</b> | <b>Candidates per Job opening</b> | <b>2018 Annual Wage</b> |
|-----------------|--|------------------------|------------------------|-----------------------------------|-------------------------|
| 53-3032         | Heavy and Tractor-Trailer Truck Drivers                                  | 1415                   | Postsecondary award    | 0.33                              | \$31,354                |
| 11-1021         | General and Operations Managers  | 810                    | Bachelor's             | 0.58                              | \$54,505                |
| 29-1141         | Registered Nurses  | 715                    | Bachelor's             | 0.09                              | \$52,482                |
| 43-1011         | First-Line Supervisors of Office and Administrative Support Workers      | 620                    | High school diploma    | 0.84                              | \$37,090                |
| 13-2011         | Accountants and Auditors   | 340                    | Bachelor's             | 0.55                              | \$46,739                |
| 29-2061         | Licensed Practical and Licensed Vocational Nurses                        | 285                    | Postsecondary Award    | 0.24                              | \$34,596                |
| 11-3031         | Financial Managers   | 280                    | Bachelor's             | 0.51                              | \$62,443                |
| 25-2031         | Secondary School Teachers, Except Special and Career/Technical Education | 265                    | Bachelor's             | 0.38                              | \$44,311                |
| 21-2011         | Clergy   | 245                    | Bachelor's             | 0.83                              | \$34,360                |
| 13-1161         | Market Research Analysts and Marketing Specialists                       | 235                    | Bachelor's             | 0.44                              | \$38,412                |

**Table B-3:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings**Northeast Region**

| <b>SOC Code</b> | <b>Occupational Title</b>   | <b>Annual Openings</b> | <b>Education Level</b>   | <b>Candidates per Job opening</b> | <b>2018 Annual Wage</b> |
|-----------------|---|------------------------|--------------------------|-----------------------------------|-------------------------|
| 29-2061         | Licensed Practical and Licensed Vocational Nurses                             | 180                    | Postsecondary Award      | 0.62                              | \$30,208                |
| 21-2011         | Clergy  | 90                     | Bachelor's               | 1                                 | \$32,933                |
| 13-1199         | Business Operations Specialists, All Other                                    | 70                     | Bachelor's               | 0.22                              | \$36,442                |
| 49-2022         | Telecommunications Equipment Installers and Repairers, Except Line Installers | 60                     | Postsecondary Award      | 0.8                               | \$32,974                |
| 13-1161         | Market Research Analysts and Marketing Specialists                            | 40                     | Bachelor's               | 0.53                              | \$28,304                |
| 15-1132         | Software Developers, Applications   | 40                     | Bachelor's               | 0.71                              | \$45,130                |
| 29-1051         | Pharmacists   | 35                     | Doctoral or professional | 0.36                              | \$84,212                |

| SOC Code | Occupational Title       | Annual Openings | Education Level     | Candidates per Job opening | 2018 Annual Wage |
|----------|--------------------------|-----------------|---------------------|----------------------------|------------------|
| 47-2211  | Sheet Metal Workers      | 30              | High school diploma | 0.6                        | \$29,383         |
| 29-2034  | Radiologic Technologists | 30              | Associate's degree  | 0.8                        | \$38,194         |
| 29-1126  | Respiratory Therapists   | 25              | Associate's degree  | 0.4                        | \$34,282         |

**Table B-4:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Northwest Region**

| SOC Code | Occupational Title                                 | Annual Openings | Education Level          | Candidates per Job opening | 2018 Annual Wage |
|----------|--|-----------------|--------------------------|----------------------------|------------------|
| 11-1021  | General and Operations Managers                    | 80              | Bachelor's               | 0.79                       | \$39,960         |
| 31-2021  | Physical Therapist Assistants                      | 25              | Associate's              | 0.71                       | \$44,659         |
| 49-9051  | Electrical Power-Line Installers and Repairers     | 20              | High school diploma      | 0.38                       | \$49,116         |
| 29-1123  | Physical Therapists                                | 15              | Doctoral or professional | 0.13                       | \$66,147         |
| 17-3023  | Electrical and Electronics Engineering Technicians | 10              | Associate's              | 0.50                       | n/a              |
| 21-1022  | Healthcare Social Workers                          | 10              | Master's                 | 0.50                       | \$34,443         |
| 17-2199  | Engineers, All Other                               | 5               | Bachelor's               | 0.38                       | \$34,050         |
| 29-1122  | Occupational Therapists                            | 5               | Master's                 | 0.07                       | \$66,673         |
| 17-2071  | Electrical Engineers                               | 5               | Bachelor's               | 0.33                       | \$66,819         |
| 45-2011  | Agricultural Inspectors                            | 5               | Bachelor's               | 1.00                       | \$38,014         |

**Table B-5:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Northern Middle Region**

| SOC Code | Occupational Title                      | Annual Openings | Education Level     | Candidates per Job opening | 2018 Annual Wage |
|----------|---|-----------------|---------------------|----------------------------|------------------|
| 53-3032  | Heavy and Tractor-Trailer Truck Drivers | 2150            | Postsecondary Award | 0.25                       | \$32,636         |
| 11-1021  | General and Operations Managers         | 1805            | Bachelor's          | 0.65                       | \$51,280         |

| SOC Code | Occupational Title  | Annual Openings | Education Level     | Candidates per Job opening | 2018 Annual Wage |
|----------|---|-----------------|---------------------|----------------------------|------------------|
| 43-1011  | First-Line Supervisors of Office and Administrative Support Workers | 1585            | High school diploma | 0.28                       | \$37,082         |
| 29-1141  | Registered Nurses   | 1300            | Bachelor's          | 0.04                       | \$48,943         |
| 41-3099  | Sales Representatives, Services, All Other                          | 1110            | High school diploma | 0.57                       | \$29,964         |
| 13-2011  | Accountants and Auditors  | 1050            | Bachelor's          | 0.48                       | \$43,840         |
| 11-3031  | Financial Managers  | 685             | Bachelor's          | 0.63                       | \$64,293         |
| 25-2021  | Elementary School Teachers, Except Special Education                | 655             | Bachelor's          | 0.30                       | \$41,065         |
| 29-2061  | Licensed Practical and Licensed Vocational Nurses                   | 650             | Postsecondary Award | 0.09                       | \$34,663         |
| 13-1199  | Business Operations Specialists, All Other                          | 635             | Bachelor's          | 0.28                       | \$38,232         |

**Table B-6:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Southern Middle Region**

| SOC Code | Occupational Title  | Annual Openings | Education Level     | Candidates per Job opening | 2018 Annual Wage |
|----------|---|-----------------|---------------------|----------------------------|------------------|
| 51-4022  | Forging Machine Setters, Operators, and Tenders, Metal and Plastic    | 190             | High school diploma | 1.00                       | \$46,438         |
| 43-1011  | First-Line Supervisors of Office and Administrative Support Workers   | 160             | High school diploma | 0.39                       | \$32,479         |
| 29-1141  | Registered Nurses   | 150             | Bachelor's          | 0.07                       | \$45,422         |
| 29-2061  | Licensed Practical and Licensed Vocational Nurses                     | 145             | Postsecondary Award | 0.31                       | \$33,889         |
| 17-2112  | Industrial Engineers  | 100             | Bachelor's          | 0.08                       | \$60,414         |
| 47-2111  | Electricians  | 95              | High school diploma | 0.75                       | \$45,538         |
| 43-5061  | Production, Planning, and Expediting Clerks                           | 90              | High school diploma | 0.54                       | \$31,549         |
| 25-2022  | Middle School Teachers, Except Special and Career/Technical Education | 70              | Bachelor's          | 1.00                       | \$39,034         |
| 49-1011  | First-Line Supervisors of Mechanics, Installers, and Repairers        | 70              | High school diploma | 0.35                       | \$39,634         |
| 33-3051  | Police and Sheriff's Patrol Officers                                  | 65              | High school diploma | 0.54                       | \$30,297         |

**Table B-7:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings**Southeast Tennessee Region**

| <b>SOC Code</b> | <b>Occupational Title</b>  | <b>Annual Openings</b> | <b>Education Level</b> | <b>Candidates per Job opening</b> | <b>2018 Annual Wage</b> |
|-----------------|--|------------------------|------------------------|-----------------------------------|-------------------------|
| 29-1141         | Registered Nurses  | 465                    | Bachelor's             | 0.07                              | \$45,569                |
| 11-1021         | General and Operations Managers  | 440                    | Bachelor's             | 0.67                              | \$40,859                |
| 43-1011         | First-Line Supervisors of Office and Administrative Support Workers      | 420                    | High school diploma    | 1.00                              | \$33,563                |
| 25-2021         | Elementary School Teachers, Except Special Education                     | 260                    | Bachelor's             | 0.47                              | \$42,477                |
| 51-1011         | First-Line Supervisors of Production and Operating Workers               | 245                    | High school diploma    | 0.52                              | \$37,610                |
| 25-2031         | Secondary School Teachers, Except Special and Career/Technical Education | 235                    | Bachelor's             | 0.05                              | \$44,196                |
| 41-3099         | Sales Representatives, Services, All Other                               | 210                    | High school diploma    | 1.00                              | \$31,222                |
| 29-2061         | Licensed Practical and Licensed Vocational Nurses                        | 200                    | Postsecondary Award    | 0.22                              | \$33,883                |
| 11-9199         | Managers, All Other  | 170                    | Bachelor's             | 0.85                              | \$45,939                |
| 11-3031         | Financial Managers   | 145                    | Bachelor's             | 0.62                              | \$54,134                |

**Table B-8:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings**Southwest Tennessee Region**

| <b>SOC Code</b> | <b>Occupational Title</b>   | <b>Annual Openings</b> | <b>Education Level</b> | <b>Candidates per Job opening</b> | <b>2018 Annual Wage</b> |
|-----------------|---|------------------------|------------------------|-----------------------------------|-------------------------|
| 29-1141         | Registered Nurses   | 200                    | Bachelor's             | 0.16                              | \$43,067                |
| 11-1021         | General and Operations Managers                                     | 140                    | Bachelor's             | 0.48                              | \$43,729                |
| 29-2061         | Licensed Practical and Licensed Vocational Nurses                   | 115                    | Postsecondary Award    | 0.36                              | \$31,282                |
| 43-1011         | First-Line Supervisors of Office and Administrative Support Workers | 115                    | High school diploma    | 0.80                              | \$32,576                |
| 49-3031         | Bus and Truck Mechanics and Diesel Engine Specialists               | 35                     | High school diploma    | 1.00                              | \$31,903                |
| 31-9091         | Dental Assistants   | 25                     | Postsecondary Award    | 0.88                              | \$30,632                |

| <b>SOC Code</b> | <b>Occupational Title</b>   | <b>Annual Openings</b> | <b>Education Level</b> | <b>Candidates per Job opening</b> | <b>2018 Annual Wage</b> |
|-----------------|---|------------------------|------------------------|-----------------------------------|-------------------------|
| 41-4011         | Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products | 25                     | Bachelor's             | 0.22                              | \$40,616                |
| 41-1012         | First-Line Supervisors of Non-Retail Sales Workers                                    | 20                     | High school diploma    | 1.00                              | \$48,472                |
| 53-7032         | Excavating and Loading Machine and Dragline Operators                                 | 20                     | High school diploma    | 0.30                              | n/a                     |
| 13-2072         | Loan Officers   | 20                     | Bachelor's             | 1.00                              | \$40,247                |

**Table B-9:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Upper Cumberland Region**

| <b>SOC Code</b> | <b>Occupational Title</b>  | <b>Annual Openings</b> | <b>Education Level</b> | <b>Candidates per Job opening</b> | <b>2018 Annual Wage</b> |
|-----------------|--|------------------------|------------------------|-----------------------------------|-------------------------|
| 29-1141         | Registered Nurses  | 155                    | Bachelor's             | 0.18                              | \$48,076                |
| 11-1021         | General and Operations Managers  | 140                    | Bachelor's             | 1.67                              | \$39,261                |
| 29-2061         | Licensed Practical and Licensed Vocational Nurses                        | 130                    | Postsecondary Award    | 0.43                              | \$30,795                |
| 25-2031         | Secondary School Teachers, Except Special and Career/Technical Education | 45                     | Bachelor's             | 0.83                              | \$35,585                |
| 25-2022         | Middle School Teachers, Except Special and Career/Technical Education    | 40                     | Bachelor's             | 0.5                               | \$38,914                |
| 11-3031         | Financial Managers   | 40                     | Bachelor's             | 4                                 | \$39,534                |
| 11-3051         | Industrial Production Managers   | 30                     | Bachelor's             | 3.5                               | \$57,466                |
| 43-5061         | Production, Planning, and Expediting Clerks                              | 20                     | High school diploma    | 0.53                              | \$29,043                |
| 21-1022         | Healthcare Social Workers  | 20                     | Master's               | 1                                 | \$33,049                |
| 49-9043         | Maintenance Workers, Machinery   | 20                     | High school diploma    | 0.8                               | \$29,243                |

## Appendix C: Wage Data by CIP Code and Degree Level

The tables below are limited to CIP codes with at least 5 graduates employed from that CIP and at that degree level. Wage data displays wages earned 2 quarters after certificate or degree receipt.

**Table C-1:** Top 10 Income Earners by CIP Code, Certificates

### Certificates

| Programs of Study Titles                                  | CIP Code | CIP Title  | Average Wage (K) * 4 Qtrs |
|---|----------|--|---------------------------|
| Engineering Technology                                    | 150303   | Electrical, Electronic and Communications Engineering Techno | \$63,244.60               |
| Ultrasonic Technician                                     | 510910   | Diagnostic Medical Sonography/Sonographer and Ultrasound Tec | \$59,844.44               |
| Network Systems   | 111003   | Computer and Information Systems Security.                   | \$56,735.44               |
| Engineering Technology                                    | 150000   | Engineering Technology, General.                             | \$52,983.80               |
| Medical Imaging- Radiography                              | 510920   | Magnetic Resonance Imaging (MRI) Technology/Technician.      | \$51,778.64               |
| Fire Fighting   | 430203   | Fire Science/Fire-fighting.                                  | \$50,762.44               |
| Prod. Design, Ops, and Maint. Path -- Operations & Maint. | 520205   | Operations Management and Supervision.                       | \$45,397.24               |
| Engineering Technology                                    | 150613   | Manufacturing Technology/Technician.                         | \$44,393.64               |
| Cardiovascular Technologists and Technicians              | 510901   | Cardiovascular Technology/Technologist.                      | \$44,007.32               |
| Engineering Technology                                    | 150612   | Industrial Technology/Technician.                            | \$43,924.68               |

**Table C-2:** Top 10 Income Earners by CIP Code, Associates

### Associates

| Programs of Study Titles                                  | CIP Code | CIP Title  | Average Wage (K) * 4 Qtrs |
|---|----------|--|---------------------------|
| Prod. Design, Ops, and Maint. Path -- Operations & Maint. | 470303   | Industrial Mechanics and Maintenance Technology. | \$64,948.44               |
| Fire Fighting   | 430203   | Fire Science/Fire-fighting.                      | \$53,160.12               |
| Nursing (RN)  | 513801   | Registered Nursing/Registered Nurse.             | \$50,662.88               |
| Industrial Hygiene  | 512202   | Environmental Health.                            | \$49,094.76               |
| Engineering Technology                                    | 150000   | Engineering Technology, General.                 | \$45,592.84               |

|   |        |  |             |
|---|--------|--|-------------|
| Business Management                                       | 520299 | Business Administration, Management and Operations, Other.   | \$43,404.16 |
| Technical Design & Preconstruction                        | 150101 | Architectural Engineering Technology/Technician.             | \$42,210.04 |
| Prod. Design, Ops, and Maint. Path -- Operations & Maint. | 150403 | Electromechanical Technology/Electromechanical Engineering T | \$41,092.84 |
| Network Systems   | 110901 | Computer Systems Networking and Telecommunications.          | \$40,203.92 |
| Respiratory Therapy                                       | 510908 | Respiratory Care Therapy/Therapist.                          | \$40,046.20 |

**Table C-3: Top 10 Income Earners by CIP Code, Bachelor's Bachelors**

| <b>Programs of Study Titles</b>        | <b>CIP Code</b> | <b>CIP Title</b>  | <b>Average Wage (K) * 4 Qtrs</b> |
|--|-----------------|---|----------------------------------|
| Nurse Practitioners                    | 513818          | Nursing Practice.                                       | \$69,945.56                      |
| Web/Multimedia Management, Programming | 140903          | Computer Software Engineering.                          | \$62,232.92                      |
| Electrical/Computer Engineering        | 141001          | Electrical, Electronics and Communications Engineering. | \$60,570.80                      |
| Industrial Engineering                 | 143501          | Industrial Engineering.                                 | \$56,185.72                      |
| Civil Engineering                      | 140801          | Civil Engineering, General.                             | \$54,378.24                      |
| Electrical/Computer Engineering        | 144201          | Mechatronics, Robotics, and Automation Engineering.     | \$54,359.32                      |
| Electrical/Computer Engineering        | 140901          | Computer Engineering, General.                          | \$53,000.16                      |
| All Other Engineers                    | 140101          | Engineering, General.                                   | \$51,811.04                      |
| Nursing (RN)                           | 513801          | Registered Nursing/Registered Nurse.                    | \$50,362.92                      |
| Nuclear Engineering                    | 142301          | Nuclear Engineering.                                    | \$50,187.76                      |